

How does richness in tree species and mycorrhizal types affect the resorption process of nutrients in leaves?



During resorption, nutrients are mobilized from senescing leaves and transported to other plant tissues. The plant conserves these resorbed nutrients for primary production in the following growing season (Lü et al., 2012).

Different types of mycorrhizal fungi associated with the trees (mostly arbuscular mycorrhizal fungi (AM) and ectomycorrhizal fungi (EM)) were found to differ in their resorption patterns (Zhang et al., 2018).

We want to understand how AM and EM fungi and tree species richness affect nutrient resorption (e.g. of nitrogen N, phosphorus P, micronutrients) in leaves using a tree diversity

experiment MyDiv. The MyDiv experiment tests the effects of tree species richness (1, 2, 4) and mycorrhizal types (AM – arbuscular mycorrhiza, EM – ectomycorrhiza, both in mixture) on ecosystem functioning. Ten deciduous tree species; five species mainly associated with AM and the other five with EM fungi; were planted in different combinations of one, two and four species mixtures.

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When? earliest in January 2025

Where? The lab analyses will be carried out in Montpellier, France (1-2 months)
The following data analyses can be done in Leipzig.

What? Chemical analyses of lignin, phenols, and micronutrients.
Calculation of resorption efficiency (NuR) for different mycorrhizal types and species richness levels

Important note!

You can merge your thesis writing with an internship (Theoretikum/Laborpraktikum).

The labwork will be conducted in the labs at the CEFÉ in Montpellier, France.

For this we will not be able to cover your travel and living costs. However, we have good experience with ERASMUS+ and the DAAD program. We could support you writing the application for travel grants.

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iDiv is a central facility of Leipzig University within the meaning of Section 92 (1) of the Act on Academic Freedom in Higher Education in Saxony (Sächsisches Hochschulfreiheitsgesetz, SächsHSFG). It is run together with the Martin Luther University Halle-Wittenberg and the Friedrich Schiller University Jena, as well as in cooperation with the Helmholtz Centre for Environmental Research – UFZ. The following non-university research institutions are involved as cooperation partners: the Helmholtz Centre for Environmental Research – UFZ, the Max Planck Institute for Biogeochemistry (MPI BGC), the Max Planck Institute for Chemical Ecology (MPI CE), the Max Planck Institute for Evolutionary Anthropology (MPI EVA), the Leibniz Institute DSMZ – German Collection of Microorganisms and Cell Cultures, the Leibniz Institute of Plant Biochemistry (IPB), the Leibniz Institute of Plant Genetics and Crop Plant Research (IPK) and the Leibniz Institute Senckenberg Museum of Natural History Görlitz (SMNG).

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References

Lü, X., Freschet, G. T., Flynn, D. F., & Han, X. (2012). Plasticity in leaf and stem nutrient resorption proficiency potentially reinforces plant-soil feedbacks and microscale heterogeneity in a semi-arid grassland. *Journal of Ecology*, 100, 144–150.

Zhang, H., Lü, X.-T., Hartmann, H., Keller, A., Han, X., Trumbore, S., & Phillips, R. P. (2018). Foliar nutrient resorption differs between arbuscular mycorrhizal and ectomycorrhizal trees at local and global scales. *Global Ecology and Biogeography*, 27, 875–885.

Read more about the MyDiv experiment:

<https://www.idiv.de/de/research/platforms-and-networks/mydiv.html>

Our working group - Experimental Interaction Ecology:

<https://www.idiv.de/de/gruppen-und-personen/kerngruppen/experimentelle-interaktionsoekologie.html>